

Work Order ID 123267

August-06-14 10:42:10 AM

123267

Page 1

Item ID: D212-664-101TRN Accept ***N900040100*** Setup Start ***NS1***
 Revision ID: Stop ***NS2***
 Item Name: Crosstube Turning Detail
 Start Date: 8/06/14 Start Qty: 1.00 ***1*** Cust Item ID:
 Required Date: 8/15/14 Req'd Qty: 1.00 ***1*** Customer:
 Reference:

Approvals: Process Plan: W Date: Tooling: Date: Run Start ***NR1***
 QC: Date: SPC.(Y/N): Date: Stop ***NR2***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
--------------------------------	--------------------------	----------------------	---------	--------	--------------	---------------	---------------	------------------	----------------

Draw Nbr	Revision Nbr
D212-664-141	E

100

0.00

100

Mori Seiki

Mori Seiki CNC Lathe Large

MORI SEIKI CNC LATHE LARGE

Memo

0.00

1-Fill tube with sand & install plugs DT8534 on both ends as per Folio FA113

2-Turn first side as per Folio FA113

3-Blend transition lines only, **do not sand whole tube**:

FOLIO REV: AA

DWG REV: E

*Use mill bastard file, brush file repeatedly with file card.

*Do not use sandpaper coarser than 320 grit.

1 ϕ
 mm L
 14/08/11

110

QC1- Inspect dimensions to dimension sheet

0.00

110

QC

Quality Control

Memo

0.00

1 ϕ
 mm L
 14/08/11

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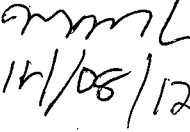
123267


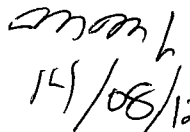
Page 2

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Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____ Run Start ***NR1***
 QC: _____ Date: _____ SPC (Y/N): _____ Stop ***NR2***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
120	MORI SEIKI CNC LATHE LARGE	0.00							
120									
Mori Seiki	Memo	0.00							
Mori Seiki CNC Lathe Large	1-Turn second side as per Folio FA113								
	2-Blend transition lines only, **do not sand whole tube**: *Use mill bastard file, brush file repeatedly with file card. *Do not use sandpaper coarser than 320 grit. FOLIO REV: <u>AA</u> DWG REV: <u>E</u>								
	3-Remove sand and plugs								
130	QC1- Inspect dimensions to dimension sheet	0.00							
130									
QC	Memo	0.00							
Quality Control	+ PERFORM ULTRA SONIC MEASUREMENT								

1 /  
 14/08/12

1 /  
 14/08/12

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Page 3

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 Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____ Run Start ***NR1***
 QC: _____ Date: _____ SPC (Y/N): _____ Date: _____ Stop ***NR2***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
140	QC8- Inspect parts - second check	0.00							
140									
QC	Memo	0.00							
Quality Control	+ CHECK ULTRA SONIC MEASUREMENT AND ORIENTATION FOR BENDING								
145		0.00							
145									
Crosstubes	Memo	0.00							
Crosstubes	GRIND ONLY TRANSITION LINES SMOOTH LONGITUDE WAY.								
150		0.00							
150									
HandFXtube	Memo	0.00							
Hand Finishing Crosstubes	1- PRESSURE WASH X-TUBE INSIDE AND OUT								
	2- ACID ETCH X-TUBE INSIDE AND OUT. USE RED SCOTCH BRITE								

JW 14-08-13

JW 14-08-18

JW 14-08-19

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Item ID: D212-664-101TRN

Accept

N900040100

Setup Start

NS1

Revision ID:

Stop

NS2

Item Name: Crosstube Turning Detail

Start Date: 8/06/14 Start Qty: 1.00

1

Cust Item ID:

Required Date: 8/15/14 Req'd Qty: 1.00

1

Customer:

Reference:

Approvals:

Process Plan:

Date:

Tooling:

Date:

Run Start

NR1

QC:

Date:

SPC (Y/N):

Date:

Stop

NR2

Sequence ID/
Work Center ID

Operation
Description

Set Up/
Run Hours

Tool ID

Tool #

Plan
Code

Accept
Qty

Reject
Qty

Reject
Number

Insp.
Stamp

160

QC5- Inspect part completeness to step on W/O

0.00

160

QC

Memo

0.00

Quality Control

1

16
9-89
14-8-21

DAS
38
9-89

14-8-21

170

Packaging

0.00

170

Packaging

Memo

0.00

Packaging

Identify and Stock in kanban rack
Location: 16

JW

14-08-21

180

QC21- Final Inspection - Work Order Release

0.00

180

QC

Memo

0.00

Quality Control

MLJ

14-08-22

mf
14-8-22

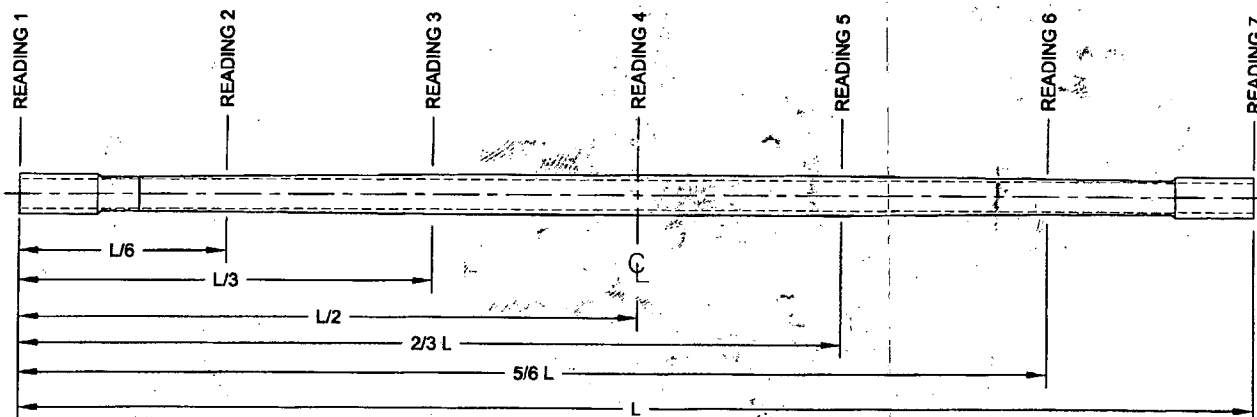
DART AEROSPACE LTD	Work Order: 123267
Description: Crosstube Assembly (205/212/412 High Fwd)	Part Number: D212-664-141
Inspection Dwg: D212-664-141 Rev: E	Page 1 of 2

FIRST ARTICLE INSPECTION CHECKLIST

	Inspection Sheet Drawing Dimension	Tolerance	Actual Dimension	Accept	Reject	Method of Inspection	Comments
SIDE A	0.200	+/-0.010	2.200	/		vern	CNC-08
	R0.063	+/-0.010	0.063	/		R6	
	2.740	+0.005/-0.000	2.740	/		vern	CNC-08
	5.097	+/-0.030	5.100	/			
	2.304	+0.005/-0.000	2.308	/			
	2.340	+0.005/-0.000	2.344	/			
	2.398	+0.005/-0.000	2.403	/			
	2.448	+0.005/-0.000	2.452	/			
	2.498	+0.005/-0.000	2.501	/			
	2.549	+0.005/-0.000	2.553	/			
	2.599	+0.005/-0.000	2.601	/			
	2.671	+0.005/-0.000	2.673	/			
	2.701	+0.005/-0.000	2.702	/			
SIDE B	0.200	+/-0.010	2.200	/		vern	CNC-08
	R0.063	+/-0.010	0.063	/		R6	
	2.740	+0.005/-0.000	2.741	/		vern	CNC-08
	5.097	+/-0.030	5.100	/			
	2.304	+0.005/-0.000	2.308	/			
	2.340	+0.005/-0.000	2.344	/			
	2.398	+0.005/-0.000	2.403	/			
	2.448	+0.005/-0.000	2.452	/			
	2.498	+0.005/-0.000	2.501	/			
	2.549	+0.005/-0.000	2.552	/			
	2.599	+0.005/-0.000	2.601	/			
	2.671	+0.005/-0.000	2.672	/			
	2.701	+0.005/-0.000	2.702	/			
	126.514	+/-0.020	126.514	/		tape	LG-11

DART AEROSPACE LTD	Work Order: 123267
Description: Crosstube Assembly (205/212/412 High Fwd)	Part Number: D212-664-141
Inspection Dwg: D212-664-141 Rev: E	Page 2 of 2

WALL THICKNESS MEASUREMENT



Location	WALL THICKNESS MEASUREMENT (IN)				Deviation Δw (max-min)	TOLERANCE
	w1	w2	w3	w4		
READING 1 L= 0"	374	364	326	389	025	0.048"
READING 2 L= 21	228	231	249	249	021	
READING 3 L= 42	343	330	354	364	026	
READING 4 L= 63	378	374	379	384	010	
READING 5 L= 84	346	339	358	369	030	
READING 6 L= 105	225	222	266	263	041	
READING 7 L= 126	371	364	381	389	025	

Calibration Result

Actual Block Thickness: 100 250

Sitescan 250 Measured Thickness: 100 250

Measured by: <i>mm-l</i>	Audited by: <i>JW</i>	Preliminary Approval:
Date: 14/08/13	Date: 14-08-13	Date:

Rev	Date	Change	Revised by	Approved
C	07.05.28	Dwg Rev updated (P/O D412-664-101)	KJ/JLM	
D	10.02.02	Dimension 126.514 was 126.51	KJ	
E	12.06.04	Wall thickness form added	KJ	
F	14.06.05	Dwg Rev updated	KJ	

Item	Qty -141	Qty -141B	Qty -141F	Part Number	Description
1	X			D212-664-141	CROSSTUBE ASSEMBLY (205/212/412 HIGH FWD)
2		X		D212-664-141B	CROSSTUBE ASSEMBLY (214 HIGH FWD)
3			X	D212-664-141F	CROSSTUBE ASSEMBLY (205/212/412 HIGH FWD) (ANODIZED)
4	1	1	1	D6005-128	CROSSTUBE
5	2		2	D2893-1	SUPPORT
6	4	4	4	D3595-063-450	RUBBER CUSHION
7		2		D5017-1	SUPPORT
8	4	4	4	MS21920-25	CLAMP (OR MS21920-26)
9	A/R	A/R	A/R	PROSEAL 890 B-2	SEALANT, AMS-S-8802 CLASS B-2

GENERAL NOTES:

- MATERIAL: MANUFACTURED FROM D6005-128
FINISHED LENGTH = 126.514±0.020
- FINISH -141 & -141B:
 - CHEMICAL CONVERSION COAT PER DART QSI 005 4.1
 - PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
 - MASK UNDERSIDE OF CROSSTUBE AS SHOWN (ZN C6-2 / C6-3, HATCHED AREA)
 - PAINT OUTSIDE PER DART QSI 005 4.2
 - REMOVE MASKING AND APPLY MATTE CLEAR COAT

- FINISH -141F:
 - ANODIZE PER MIL-A-8625, TYPE II, CLASS 1.
 - ALODINE (DO NOT ETCH) PER QSI 005 4.1.2
 - PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
 - MASK UNDERSIDE OF CROSSTUBE AS SHOWN (ZN C6-2 / C6-3, HATCHED AREA)
 - PAINT OUTSIDE PER DART QSI 005 4.2
 - REMOVE MASKING AND APPLY MATTE CLEAR COAT

*NOTE: BETWEEN FINISHING OPERATIONS EXTREME CARE MUST BE TAKEN NOT TO CONTAMINATE OR DAMAGE FINISHED SURFACES.

- TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED
- UNITS: INCHES UNLESS OTHERWISE NOTED.
- BREAK SHARP EDGES: 0.005 TO 0.010 MAX.
- IDENTIFICATION: SCRIBE DART PART NUMBER "D212-664-XXX" AND BATCH NUMBER ON INSIDE OF CUFF USING VIBRATING STYLUS
- WEIGHT: D212-664-141/-141B/-141F = 33.6 lbs
- PART IS SYMMETRIC ABOUT CENTERLINE.
- EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.

MACHINING

- RUN CUTTER OFF PART. BLEND OUT EDGE LONGITUDINALLY, TRANSITION SHOULD BE SMOOTH.

BENDING

- BEND PROGRESSIVELY WITH A MINIMUM OF 3 PASSES. MAXIMUM TUBE FLATTENING DUE TO BENDING IS 7.2% (BASED ON O.D.) IN LOWER HALF OF R35.5 BEND AND 8% (BASED ON O.D.) ON REMAINING TUBE.
- LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038.

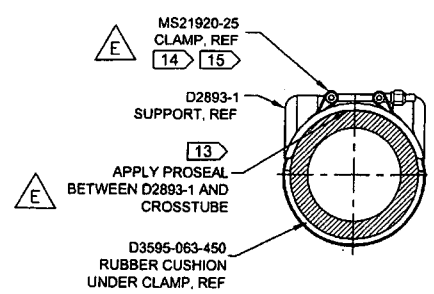
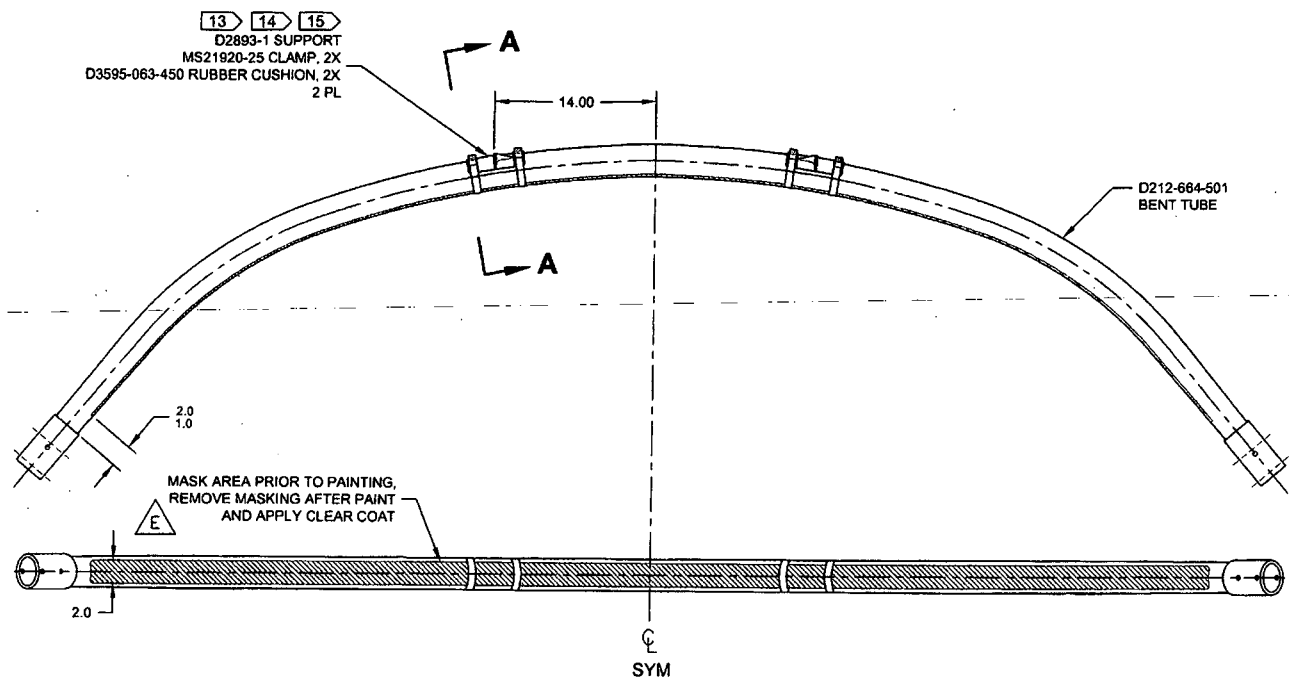
ASSEMBLY

- TO INSTALL D2893-1 / D5017-1 SUPPORT: ABRASE MATING SURFACE OF SUPPORT AND CROSSTUBE WITH 180-GRIT SANDPAPER AND REMOVE RESIDUE WITH MEK (OR EQUIVALENT). APPLY A 0.04" TO 0.07" THICK LAYER OF PROSEAL 890 CLASS B-2 (OR AMS-S-8802 CLASS B-2) SEALANT TO MATING SURFACE OF SUPPORT.
- INSTALL MS21920-25 CLAMPS (OR -26) WITH D3595-063-450 RUBBER CUSHIONS TO SECURE THE SUPPORT ON TOP SIDE OF THE CROSSTUBE. ENSURE CLAMPS ARE ON TOP SIDE OF CROSSTUBE.
- TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING. PRIOR TO PACKAGING, RE-CHECK TORQUE ON CLAMPS AFTER PROSEAL 890 SEALANT HAS CURED FOR 72 HOURS.

E	ADD -141F, D5017-1 WAS D2893-1 (-141B), PROSEAL WAS MAGNOBOND, NOTE 2: ADD INSPECTION WINDOW, NOTE 11: ALLOW 7.2% CRUSH, NOTE 15: ADD 72HR CURE AND RETORQUE FOR PROSEAL, ADD SHEET 3, CLAMPS REVERSED TO PREVENT CHAFING (B7-2, B7-3), BEND HEIGHT TOL. NOW 0.25 WAS 0.13 (C1-3), INCCORP. DEO D-1/-2/-3	CP	14.04.01
D	REFORMAT/REVISE GENERAL NOTES/PART LIST; REORGANIZED VIEWS AND REFORMATTED DRAWING TO CURRENT STANDARDS; ADD -141B (ZN B4-2, D4-2); REMOVED REF & ADD TOLERANCES (ZN B4-3, C6-3, C8-3 & B6-3); RELOCATED FLAG #6 PER PAR 08-046 (ZN A5-3); MOVED TURNING DETAIL & UPDATED TOLERANCE TO SHEET 4	RF	09.09.30
C	REMOVE -851 ABRASION STRIP; ADD MAGNOBOND 6398, CUSHION, REVERSE CLAMPS	PH	07.03.08
B	ADD HOLES FOR COMPATABILITY WITH BHT/AA SKIDTUBES	PH	05.02.04
A	NEW ISSUE	CP	00.12.12
REV.	DESCRIPTION	BY	DATE
DESIGN	DP		
DRAWN	DP		
CHECKED	DW		
MFG. APPR.			
APPROVED			
DE APPR.			
DATE	14.04.01		

DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
DRAWING NO. D212-664-141	REV. E SHEET 1 OF 5
TITLE XTUBE ASS'Y (205/212/412 HI FWD)	SCALE NTS
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2014-05-26
WD

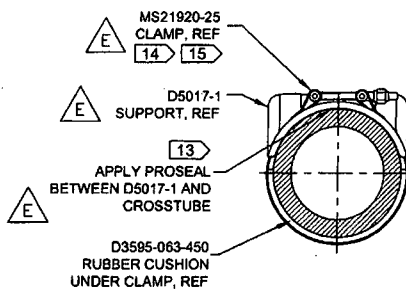
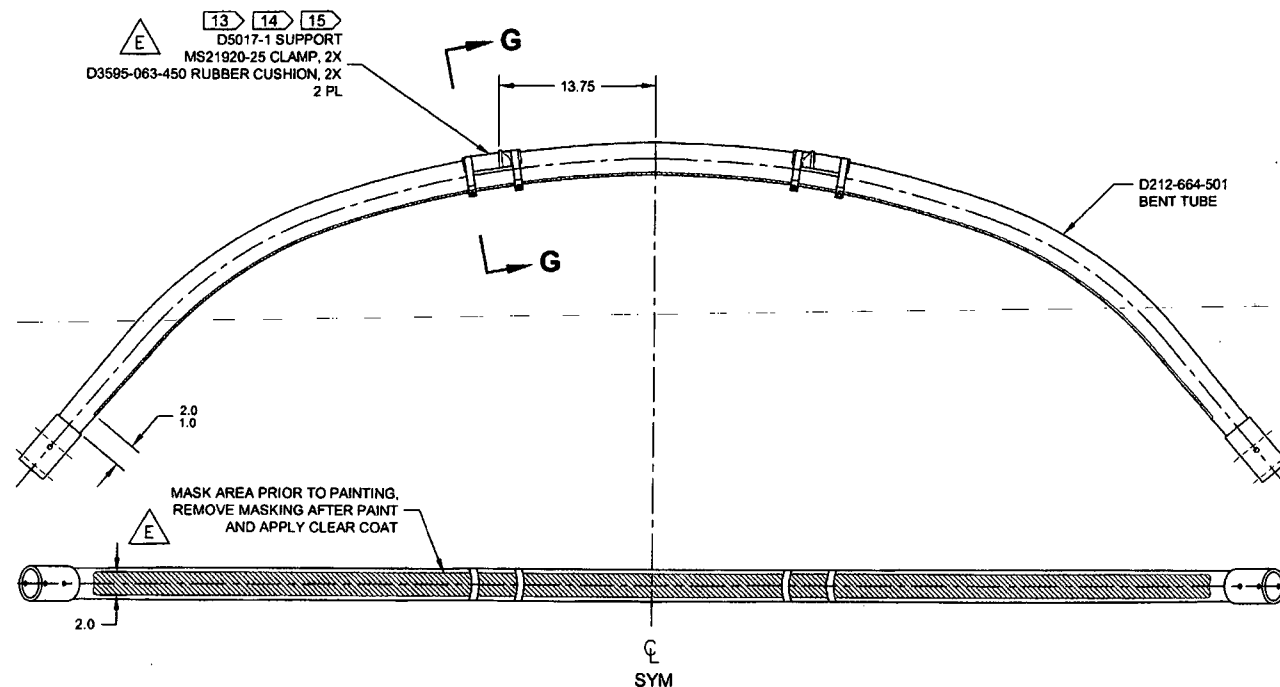


SECTION A-A
SCALE 4X

D212-664-141/-141F
ASSEMBLY DETAIL

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2014-05-26
AND

DESIGN	Q	DART AEROSPACE LTD	
DRAWN	Q	HAWKESBURY, ONTARIO, CANADA	
CHECKED	W	DRAWING NO.	REV. E
MFG. APPR.	W	D212-664-141	SHEET 2 OF 5
APPROVED	W	TITLE	SCALE
DE APPR.	W	XTUBE ASS'Y (205/212/412 HI FWD)	NTS
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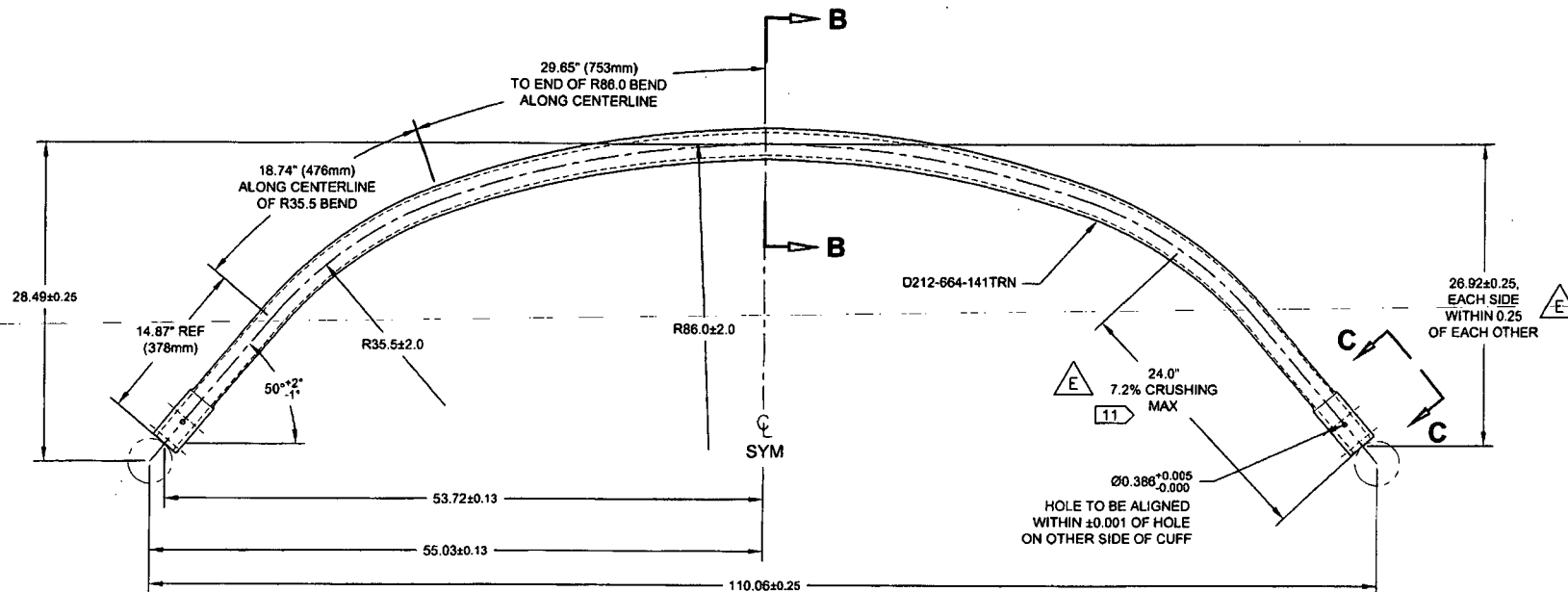


SECTION G-G
SCALE 4X

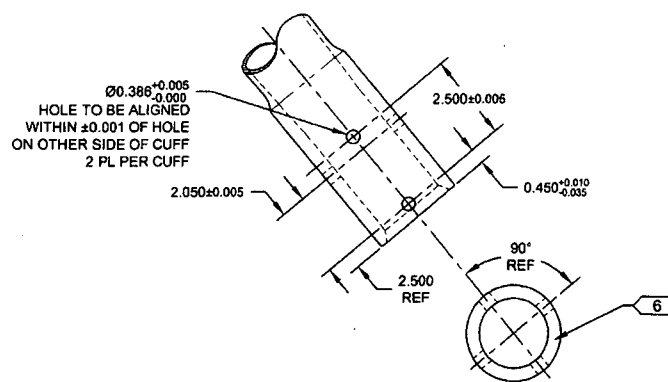
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ASSEMBLY DETAIL

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2014-05-26

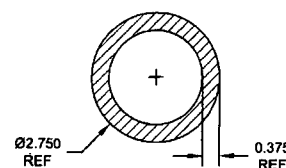
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D212-664-501
BENDING AND DRILLING DETAIL 11



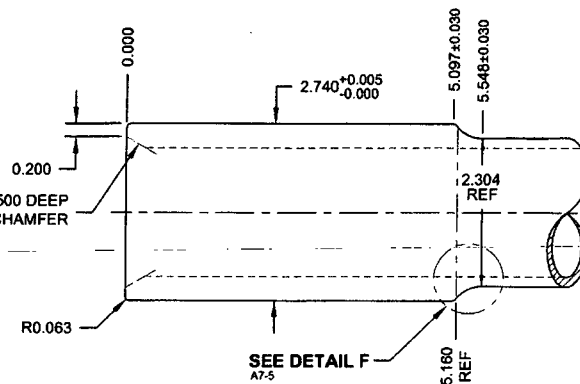
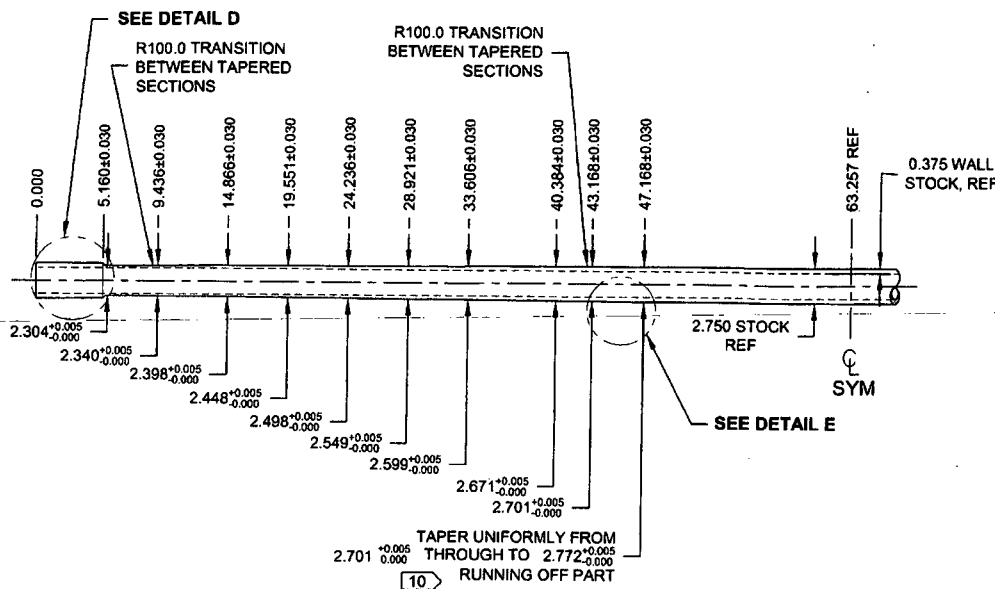
VIEW C-C: CUFF DETAIL
SCALE 3X



SECTION B-B
SCALE 4X

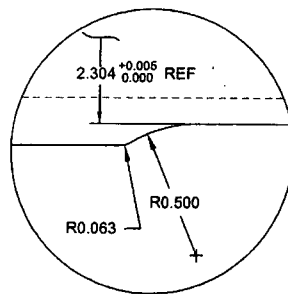
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CHECKED	9	DRAWING NO.	REV. E
MFG. APPR.	9	D212-664-141	SHEET 4 OF 5
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DE APPR.	9	XTUBE ASS'Y (205/212/412 HI FWD)	NTS
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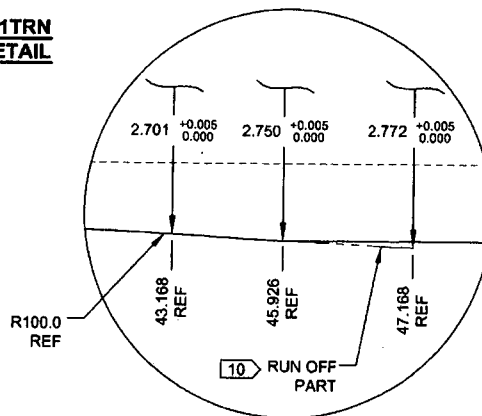


DETAIL D:
CROSSTUBE CUFF
SCALE 5X

D212-664-141TRN
TURNING DETAIL



DETAIL F:
CUFF TRANSITION
SCALE 10X



DETAIL E:
TAPER RUN-OFF
NOT TO SCALE

RELEASED
2014-05-26

DESIGN	9	DART AEROSPACE LTD	
DRAWN	9	HAWKESBURY, ONTARIO, CANADA	
CHECKED	DLW	DRAWING NO.	REV. E
MFG. APPR.	DLW	D212-664-141	SHEET 5 OF 5
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DE APPR.	DLW	XTUBE ASS'Y (205/212/412 HI FWD)	NTS
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